WHAT IS CLAIMED IS:

1. A position sensor comprising:

an excitation light source;

an interface structure comprising a surface plasmon waveguide formed of a dielectric, said interface structure sandwiched between negative dielectrics and adapted to be positioned over a substrate.

2. The position sensor according to Claim 1, wherein interfaces of said interface structure are in parallel.

3. The position sensor according to Claim 1, wherein normals to the interface structure are present in the same plane.

4. The position sensor according to Claim 1, further comprising a plurality of interface structures.

5. The position sensor according to Claim 4, wherein the plurality of interface structures are each shaped as one of a straight line, a cross, a ring, and an array.

6. A method for detecting a position of a substrate, comprising the steps of:

preparing an interface structure which functions as a waveguide of surface plasmon and in which a dielectric is sandwiched between negative dielectrics; and

detecting the positional relationship between the interface structure and an object on the substrate to be detected by passing excitation light through the interface structure to generate localized plasmon at an outlet of the interface structure, and detecting fluctuations of the localized plasmon due to the presence of the object to be detected.

7. An alignment apparatus comprising:

an excitation light source;

an interface structure comprising a surface plasmon waveguide formed of a dielectric, said interface structure sandwiched between negative dielectrics; and

a substrate with a microstructure on a surface therein positioned below said interface structure, wherein plasmon intensity with respect to the microstructure on the surface is detected by the interface structure, and the positional relationship between the interface structure and the microstructure is thereby detected.

8. The alignment apparatus according to Claim 7, wherein the interface structure is provided in a mask.

9. The alignment apparatus according to Claim 8, wherein the interface structure penetrates through the substrate of the mask comprising the interface structure.

10. The alignment apparatus according to Claim 8, wherein a light-shielding layer of the mask comprises a negative dielectric.

11. The alignment apparatus according to Claim 7, wherein the microstructure comprises a metal.

12. The alignment apparatus according to Claim 7, wherein the microstructure is provided as a concave portion on the substrate to be exposed.

13. The alignment apparatus according to Claim 12, wherein the microstructure is provided as a concave portion on the substrate to be exposed.

14. The alignment apparatus according to Claim 12, wherein the microstructure is provided as a convex portion on the substrate to be exposed.

15. The alignment apparatus according to Claim 7,

wherein the height of the microstructure from the surface of the substrate to be exposed is at least as great as a thickness of a photosensitive material film provided on the substrate to be exposed.

16. A method for alignment, comprising the steps of:

preparing an interface structure comprising a surface plasmon waveguide formed of a dielectric sandwiched between negative dielectrics;

detecting the positional relationship between the interface structure and an object on a substrate to be detected by passing excitation light through the interface structure to generate localized plasmon at an outlet of the interface structure and detecting fluctuations of the localized plasmon due to the presence of the object to be detected; and

controlling the positions of the interface structure and the object to be detected based on the detected positional relationship.